



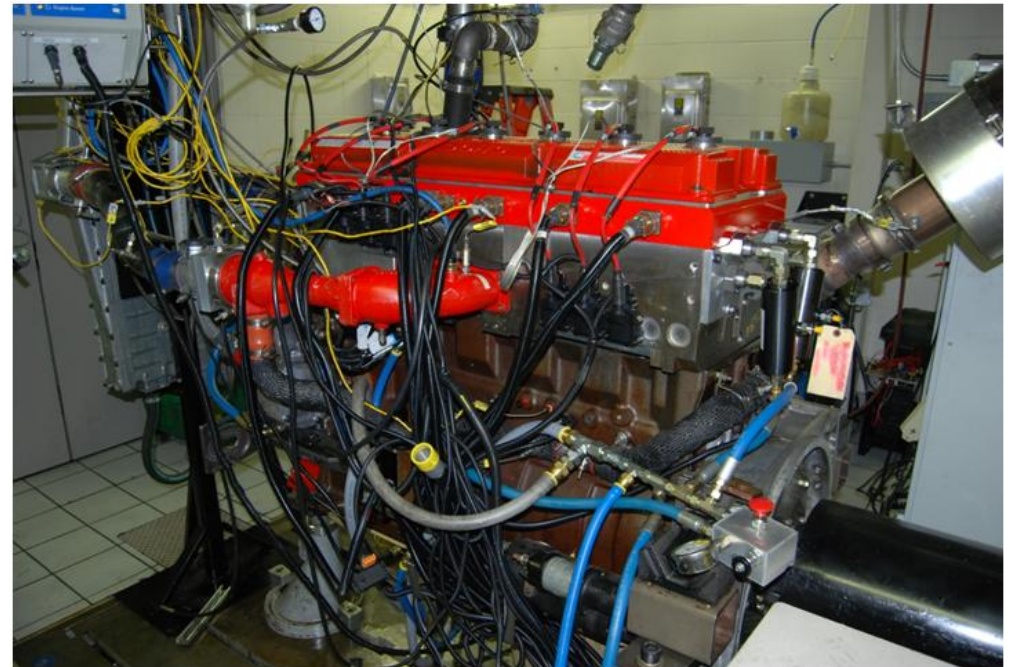
# Improving the Efficiency of Spark Ignited, Stoichiometric Natural Gas Engines

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**Poster Location P-09**





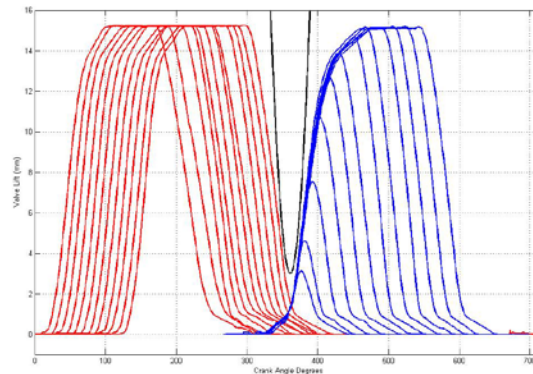
## Direction

### Utilization of Camless Technology to Improve the Efficiency of a Stoichiometric Natural Gas Engine

- High geometric compression ratio with late intake valve closing
- Full camless head
- Unthrottled operation
- Cylinder deactivation
- 3-way catalyst for emissions control

## Results

- Demonstrated BTE > 40%
- Composite BTE > 38% on 13-mode steady-state test
- Composite NO<sub>x</sub> emissions < 0.01 g/kW-hr



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